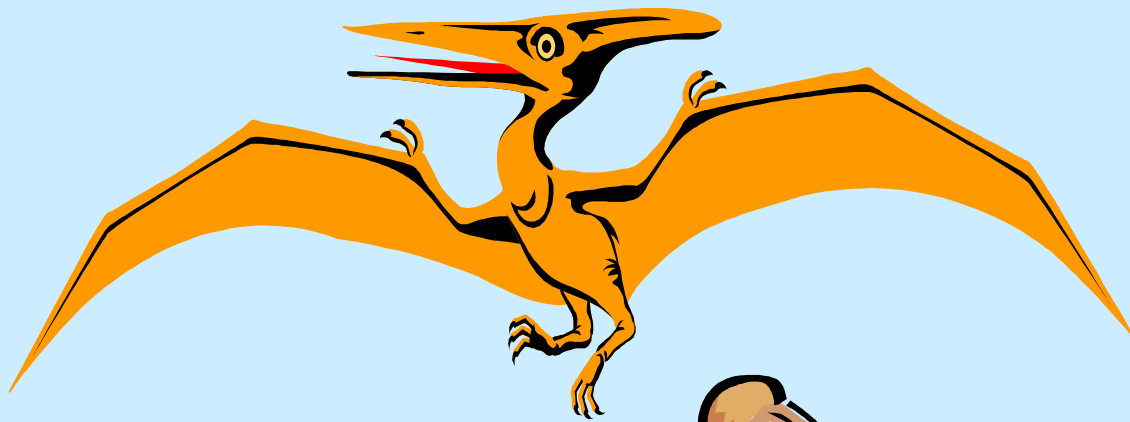


ACCIDENT CAUSATION

**Protect the Force Through Risk
Management**

AC1



Early Man



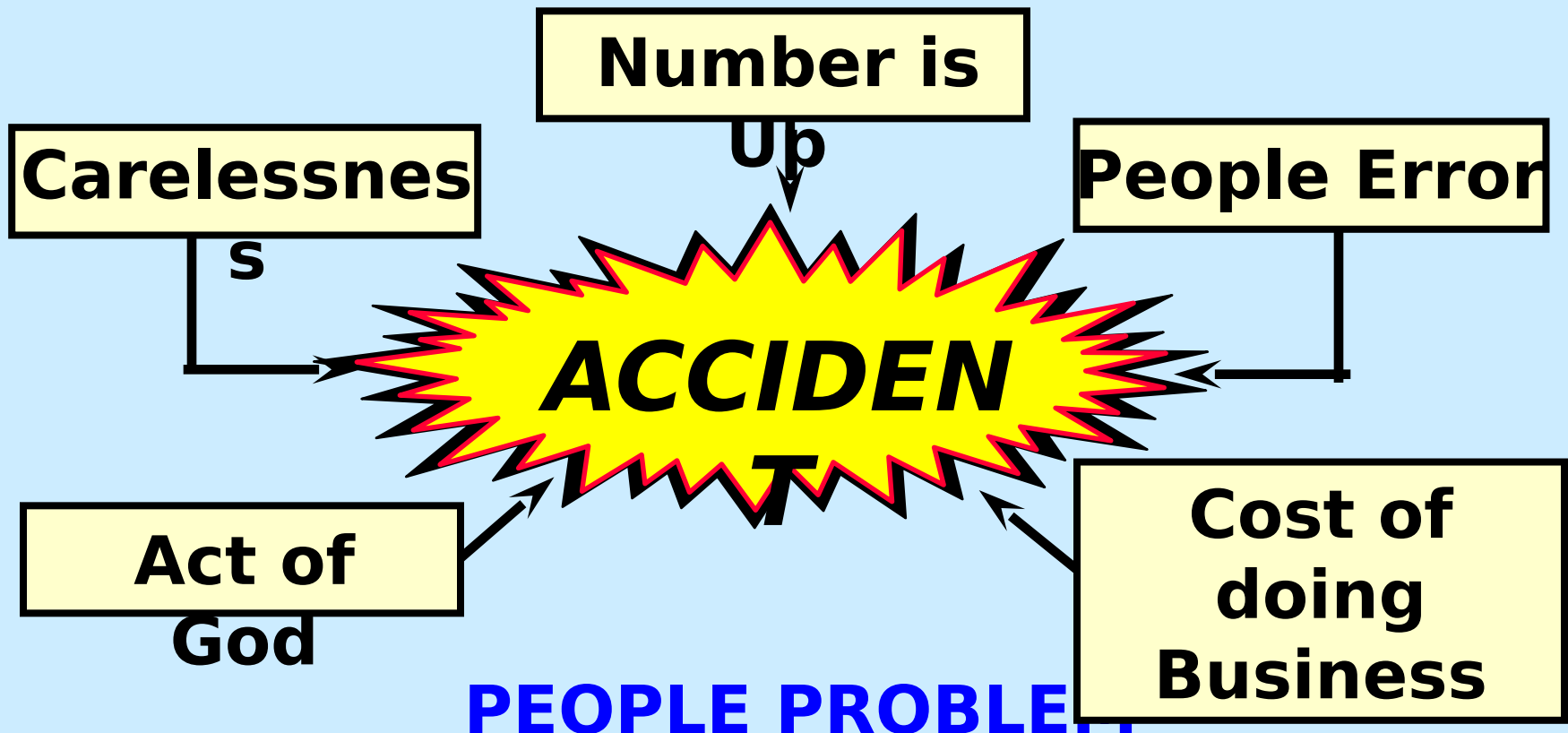
Protect the Force Through Risk
Management

AC2

Industrial Revolution



Factory managers reasoned that workers were hurt because —



Protect the Force Through Risk Management

AC3

Heinrich's Theorems



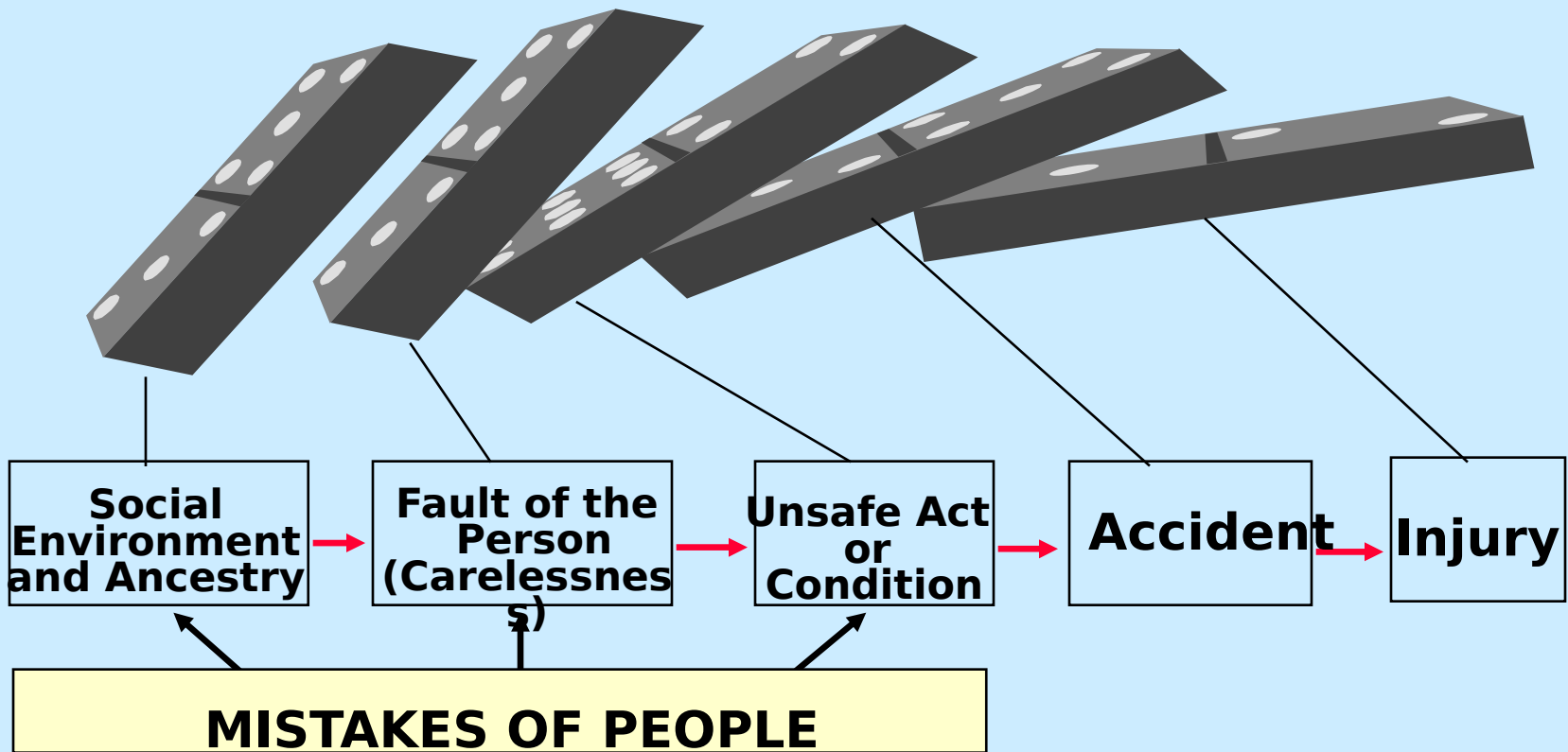
1932 - First Scientific Approach to Accident Causation/Prevention

H.W. Heinrich

- ***INJURY*** - caused by accidents.
- ***ACCIDENTS*** - caused by an unsafe act, injured person, or an unsafe condition / work place.
- ***UNSAFE ACTS/CONDITIONS*** - caused by careless persons or poorly designed or improperly maintained equipment.
- ***FAULT OF PERSONS*** - created by social environment or acquired by ancestry.
- ***SOCIAL ENVIRONMENT/ANCESTRY*** - where and how a person was raised and educated.

Domino Theory

“Industrial Accident Causation Model”



Protect the Force Through Risk Management

AC5

Building on Heinrich's Theory

Corrective Action Sequence (The three "E"s)

-

Engineering

- **Education**

-

Enforcement

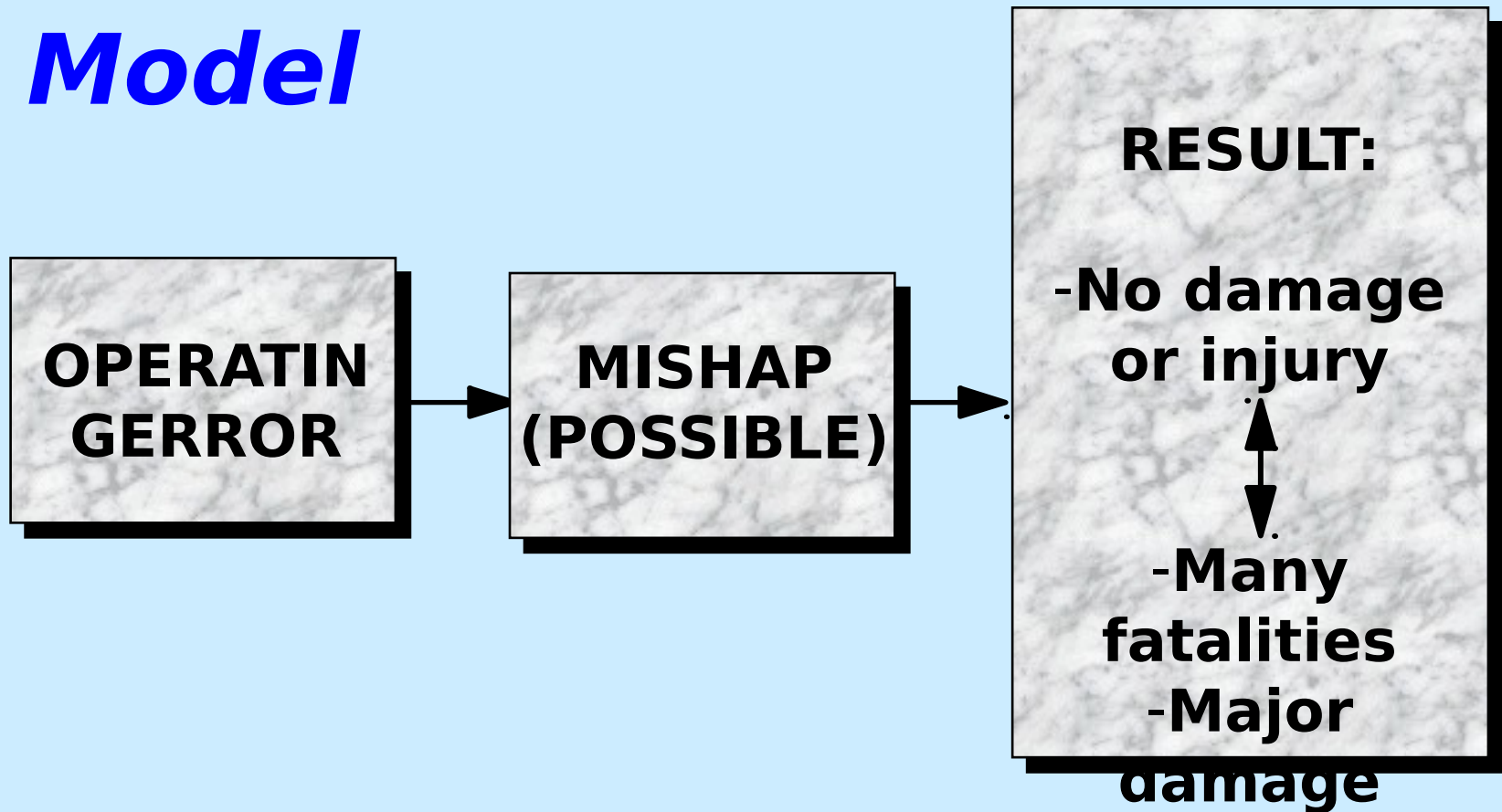
Prevention Through Risk
Management

Modern Causation



- **How accidents are caused & how to correct those causes.**
- **Parallels Heinrich's to a point.**
 - Injury is called **RESULT**, indicating it could involve damage as well as personal injury and the result can range from no damage to the very severe.
 - The word **MISHAP** is used rather than Accident to avoid the popular misunderstanding that an accident necessarily involves injury or damage.
 - Finally, the term **OPERATING ERROR** is used instead of Unsafe Act & Unsafe condition.

Modern Causation Model



Examples



Operating Errors:

- **Being in an unsafe position**
- **Stacking supplies in unstable stacks**
- **Poor housekeeping**
- **Removing a guard**

SYSTEM DEFECTS



**Operating Errors occur
because
people make mistakes, but
more importantly, they occur
because of System Defects**

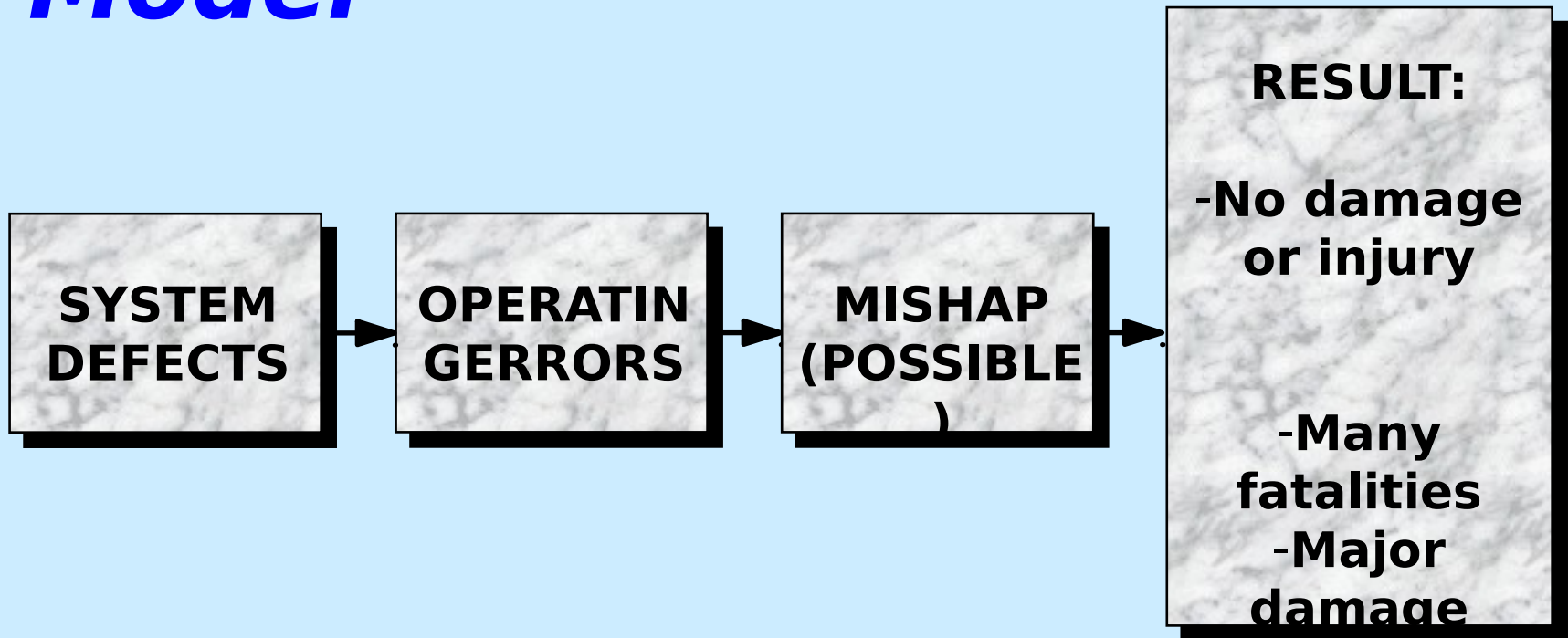
- **Revolutionized
accident prevention**
- **A weakness in the
design or operation of**

~~a system or program~~

Protect the Force Through Risk
Management

AC10

Modern Causation Model



Examples



Systems defects include:

- **Improper assignment of responsibility**
- **Improper climate of motivation**
- **Inadequate training and education**
- **Inadequate equipment and supplies**
- **Improper procedures for the selection & assignment of personnel**

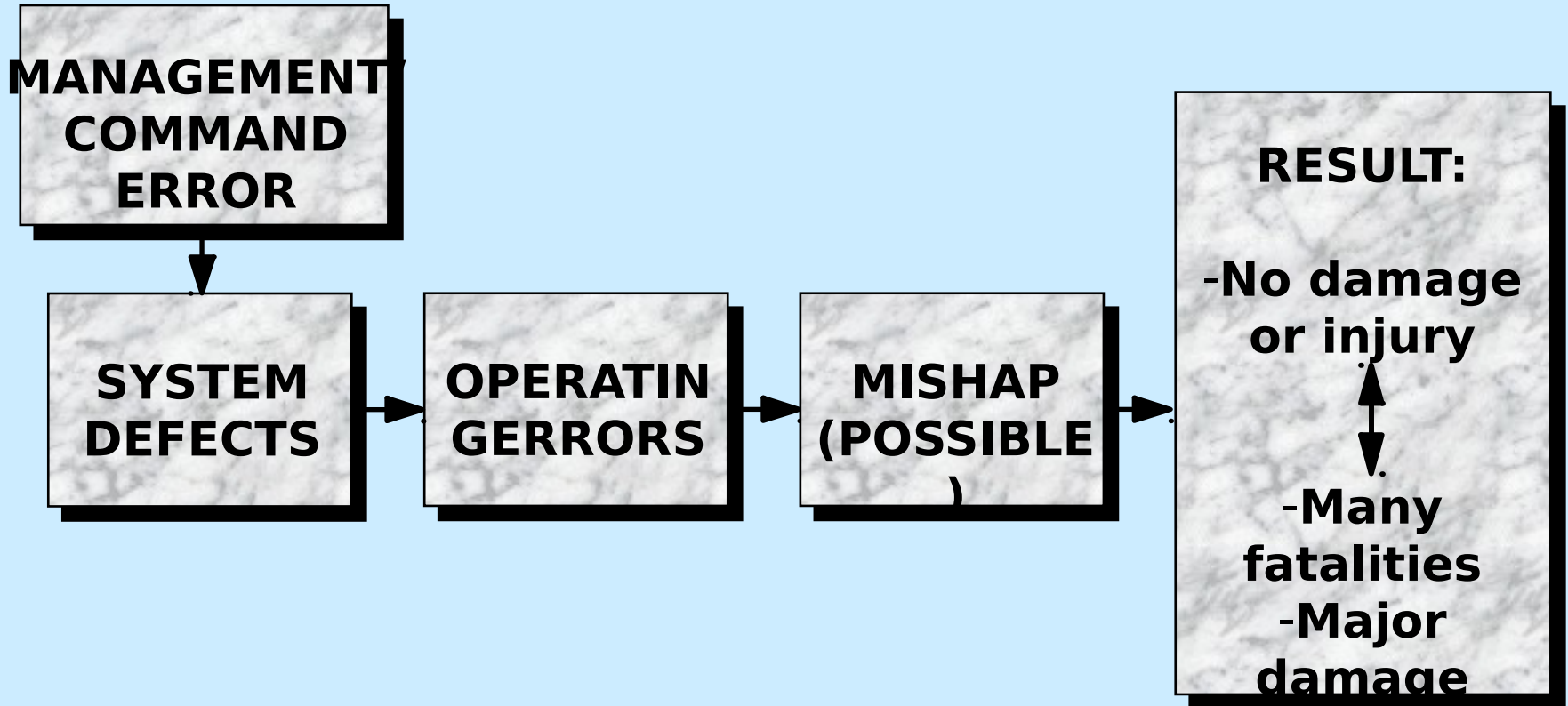
MANAGEMENT / COMMAND ERROR



**System defects occur because of
Management/Command Errors**

- Decisions made by
Managers/Commanders
in the way the system is designed or
operated result in system defects.**

Modern Causation Model



Examples



Solvent Tanks:

***Soldiers not provided
proper PPE for Task
(gloves, apron, splash
proof goggles).***

Safety Program Defect



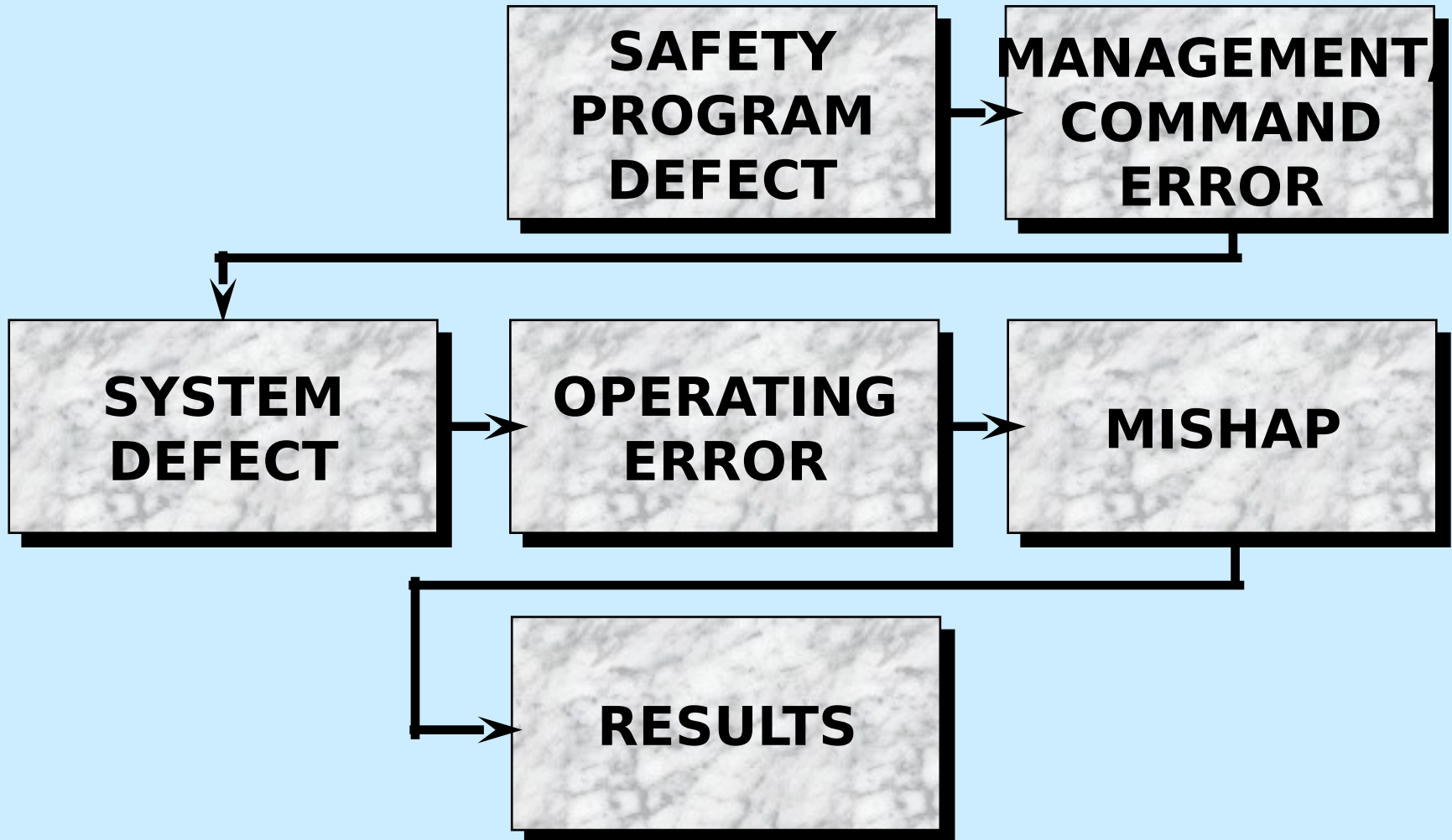
A defect in some aspect of the safety program that allows an avoidable error to exist.

- **Ineffective Information Collection**
- **Weak Causation Analysis**
- **Poor Countermeasures**
- **Inadequate Implementation Procedures**
- **Inadequate Control**

**Protect the Force Through Risk
Management**

AC16

Modern Causation Model



Examples



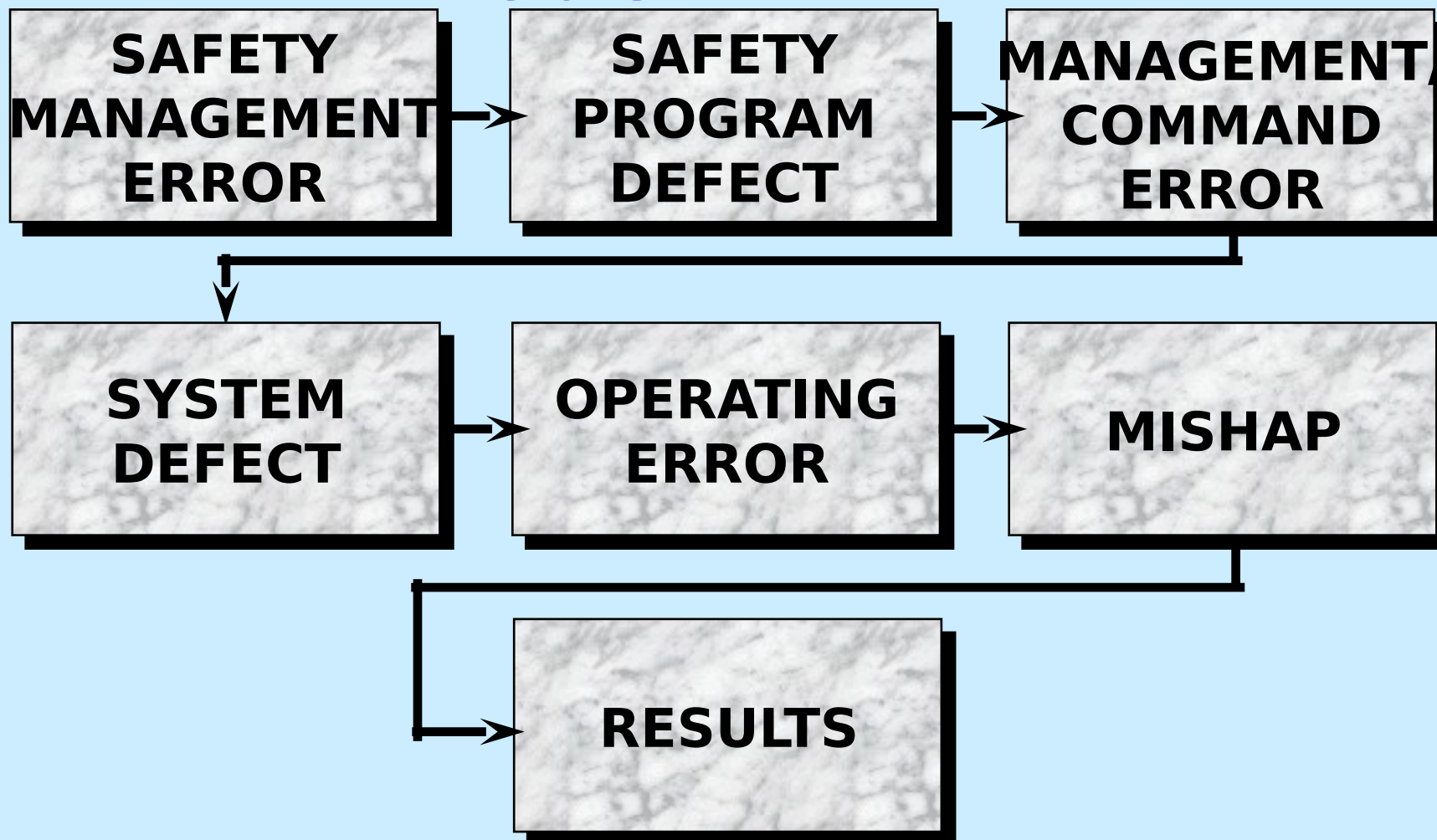
Split Rim Tires

Safety Management Error



- **A weakness in the knowledge or motivation of the safety manager that permits a preventable defect in the safety program to exist.**

Modern Causation Model



Protect the Force Through Risk Management

AC20

Examples



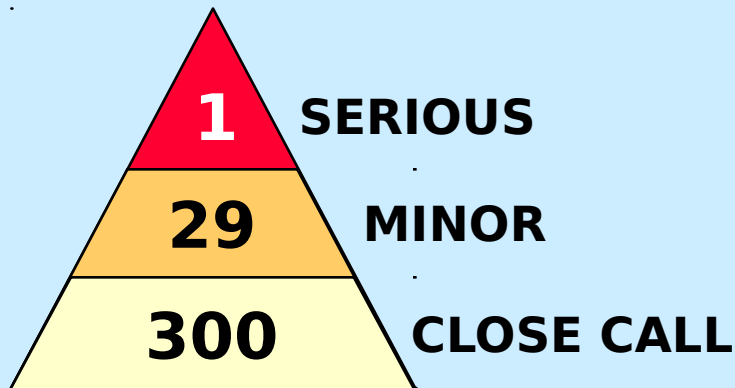
***Split Rim Tires:*
*Safety Manager or
Safety Officer/NCO
knows the hazards
yet does not enforce
the standards.***

Near-Miss Relationship

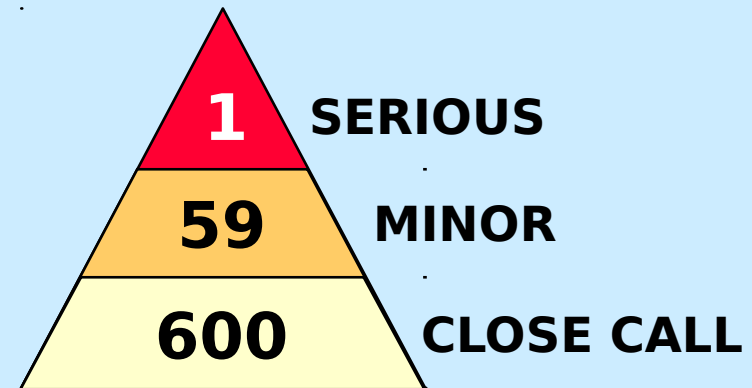


- Initial studies show for each disabling injury, there were 29 minor injuries and 300 close calls/no injury.
- Recent studies indicate for each serious result there are 59 minor and 600 near-misses.

INITIAL STUDIES



RECENT STUDIES



Seven Avenues



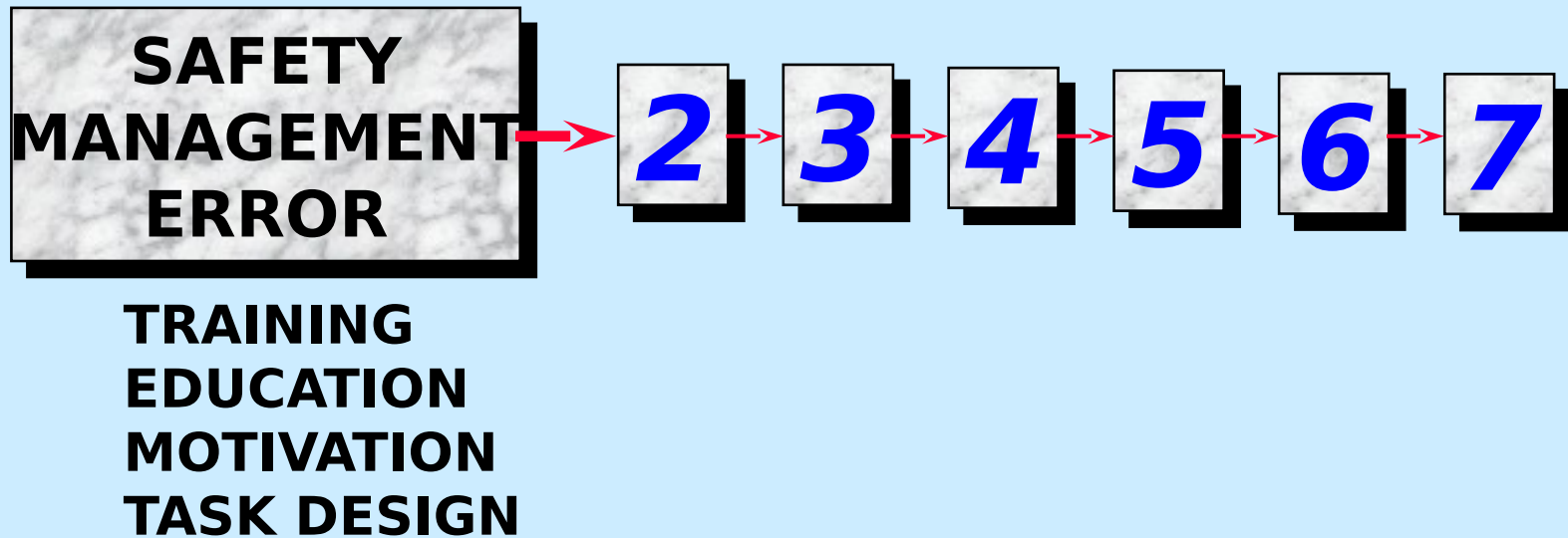
There are seven avenues through which we can initiate countermeasures. None of these areas overlap. They are:

- **Safety management error**
- **Safety program defect**
- **Management / Command error**
- **System defect**
- **Operating error**
- **Mishap**
- **Result**

Seven Avenues

Potential countermeasures for each modern causation approach include:

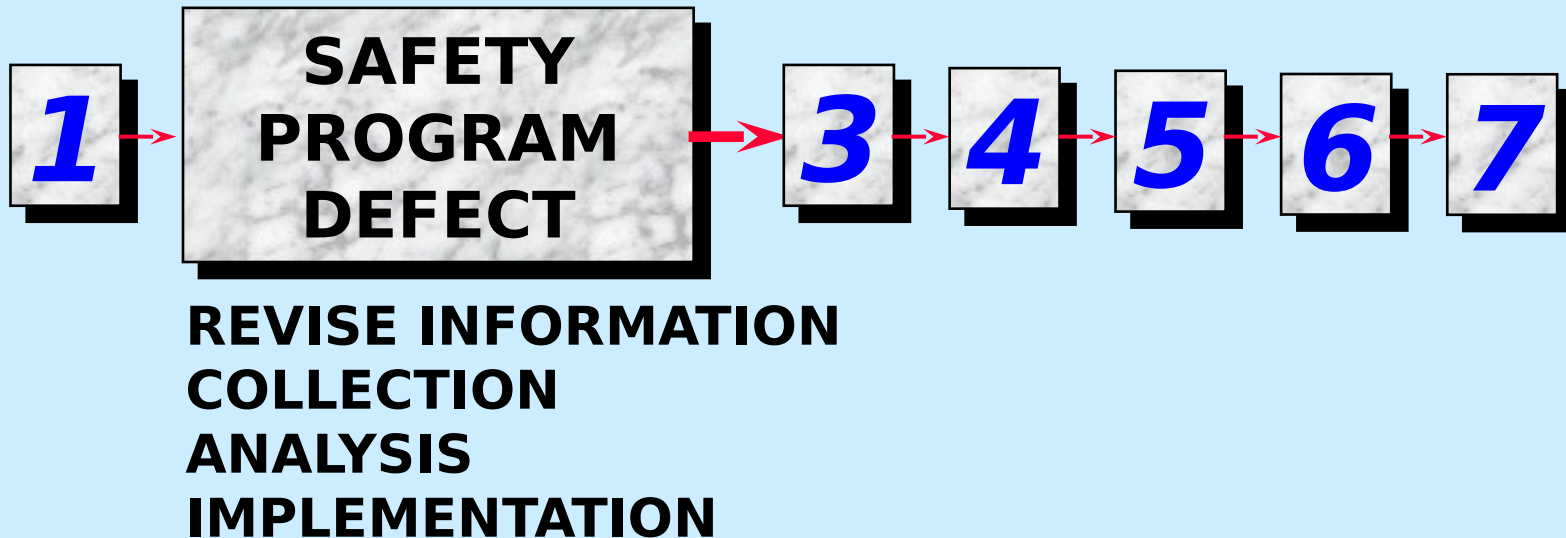
1



Seven Avenues

Potential countermeasures for each modern causation approach include:

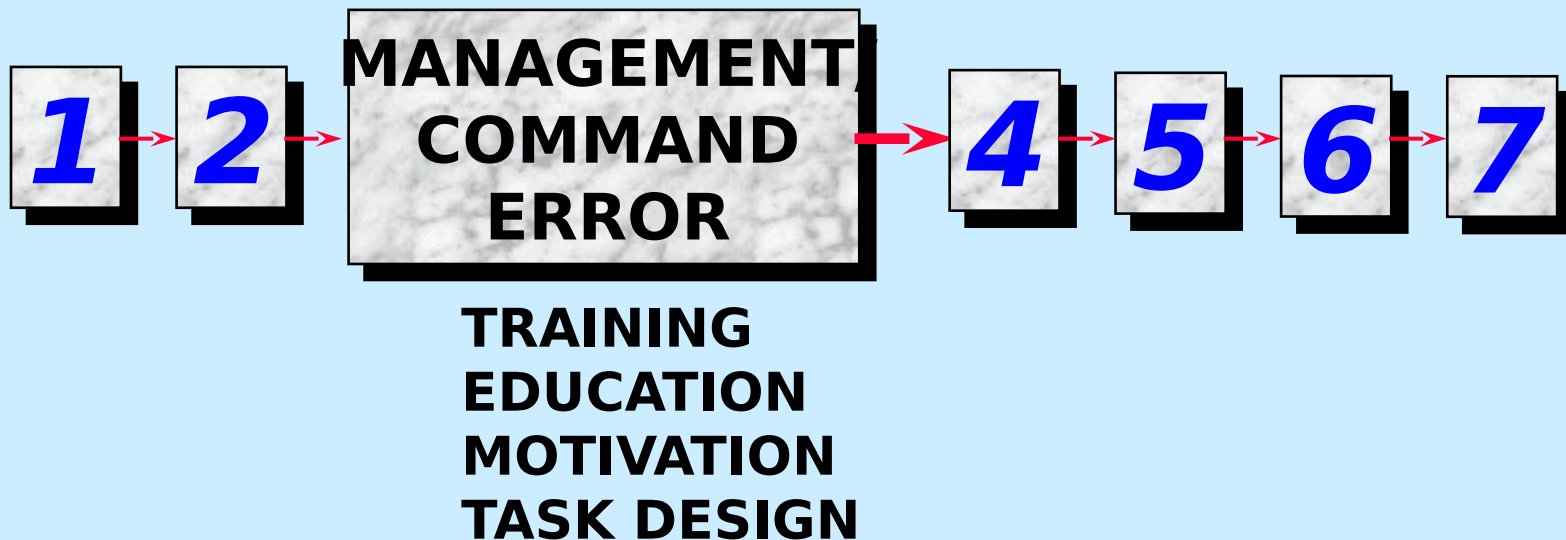
2



Seven Avenues

Potential countermeasures for each modern causation approach include:

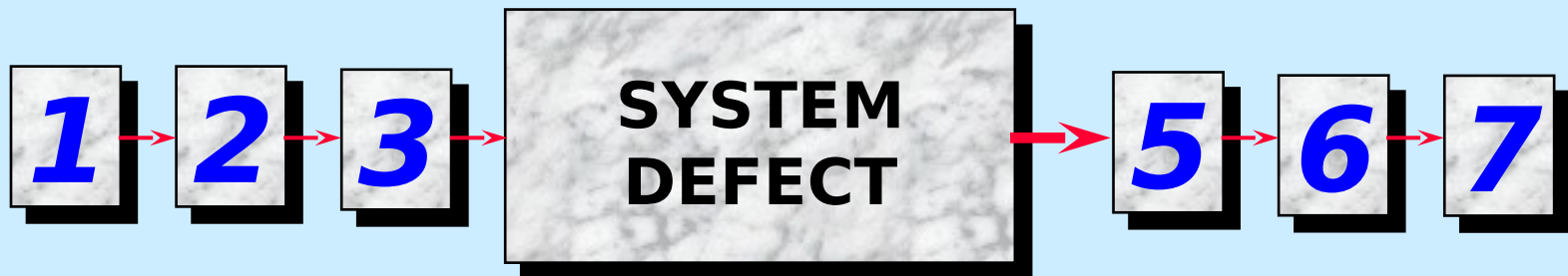
3



Seven Avenues

Potential countermeasures for each modern causation approach include:

4



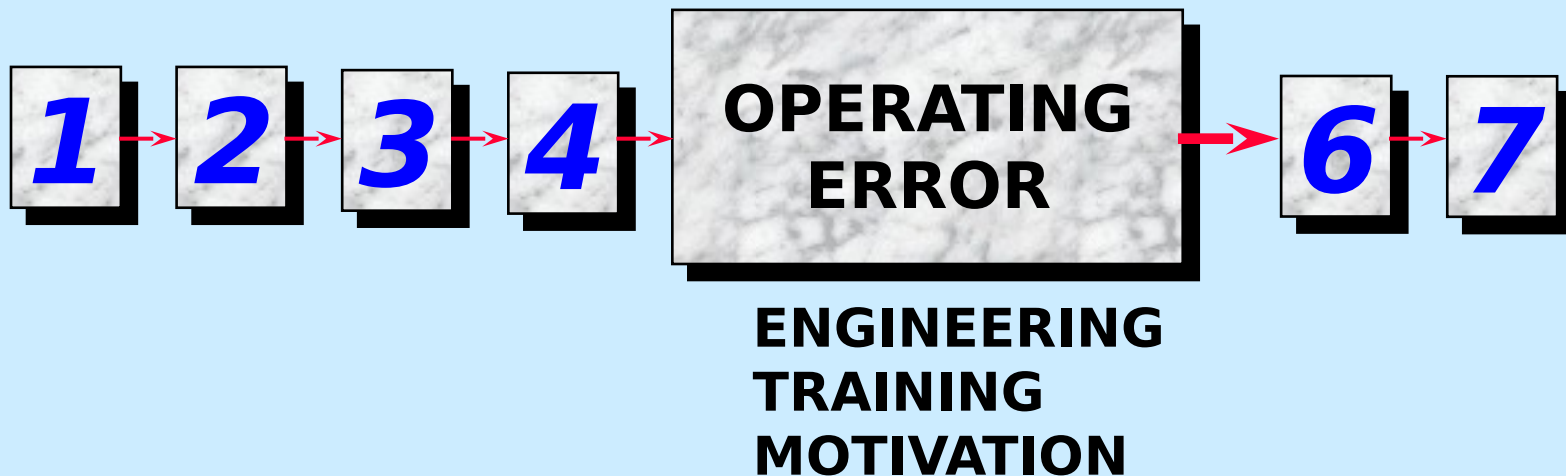
DESIGN REVISION VIA--

- SOP
- REGULATIONS
- POLICY LETTERS
- STATEMENTS

Seven Avenues

Potential countermeasures for each modern causation approach include:

5



Seven Avenues

Potential countermeasures for each modern causation approach include:

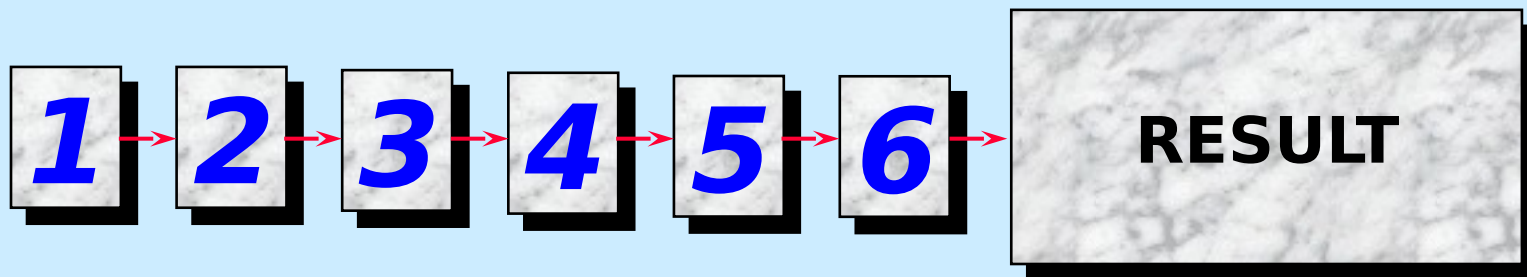
6



Seven Avenues

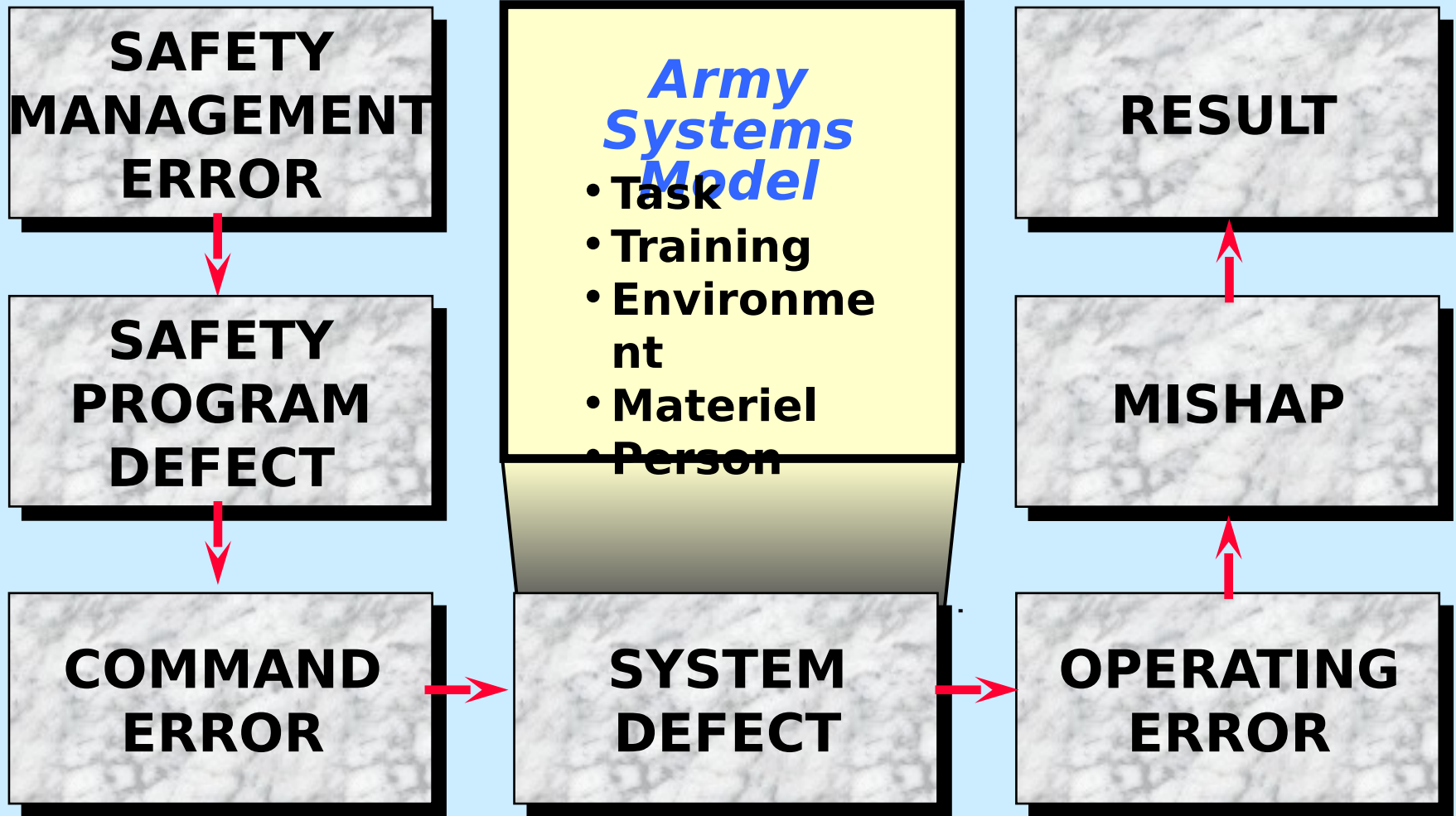
Potential countermeasures for each modern causation approach include:

7



**CONTAINMENT
FIREFIGHTING
RESCUE
EVACUATION
FIRST AID**

Army Systems Model



Protect the Force Through Risk Management

Army Systems Model



A system is simply a group of interrelated parts which, when working together as they were designed to do, accomplish a goal. Using this analogy, an installation or organization can be viewed as a system.

The elements of the Army Systems Model are:

- **Task**
- **Person**
- **Training**
- **Environment**
- **Materiel**

Army Systems Model



TASK

- **Communication Control**
- **Arrangement**
- **Demands on soldiers**
- **Time aspects**

Army Systems Model



PERSON

Selection

- Mentally
- Physically
- Emotionally
- Qualified

Motivation

- Positive
- Negative
- Retention

Army Systems Model



TRAINING

Types	Targets	Considerations
• Initial • Update • Remedial	• Operator • Supervisor • Management	• Quality/Quantity

Army Systems Model



ENVIRONMENT

- **Noise**
 - **Weather**
 - **Facilities**
 - **Lighting**
- **Ventilati
on**

Army Systems Model



MATERIEL

- **Supplies**
 - **Equipment**
 - **Machine
Design**
- **Maintenance**

ARE THERE ANY QUESTIONS?

